4 PRACTICE AND APPLY

Assignment Guide

Answer Transparencies available for all exercises

Basic:
Day 1: SRH p. 992 Exs. 1–4
pp. 701–704
Exs. 1, 2, 3–9 odd, 11–13, 17–21, 24–28, 35–41, 44–60 even

Average:
Day 1: pp. 701–704
Exs. 1, 2, 4–8 even, 13, 14, 17–19, 22–32, 35–42, 45, 48, 51, 55, 59

Advanced:
Day 1: pp. 701–704
Exs. 1, 2, 9, 10, 15, 16, 18, 19, 22, 23, 26–34*, 36–43*, 49, 57, 61

Block:
pp. 701–704
Exs. 1, 2, 4–8 even, 13, 14, 17–19, 22–32, 35–42, 45, 48, 51, 55, 59 (with 10.4)

Differentiated Instruction

See *Algebra 2 Best Practices Toolkit* for suggestions on addressing the needs of a diverse classroom.

Homework Check

For a quick check of student understanding of key concepts, go over the following exercises:

Basic: 5, 17, 20, 28, 35

Average: 6, 18, 21, 30, 36

Advanced: 10, 19, 22, 31, 37

Extra Practice

- Student Edition, p. 1019
- Chapter 10 Resource Book: Practice levels A, B, C, pp. 28–30

Practice Worksheet

An easily-readable reduced practice page (with answers) for this lesson can be found on p. 680C.

CHOOSING CARDS **A card is randomly drawn from a standard deck of 52 cards. Find the probability of drawing the given card.**

11. The king of diamonds $\frac{1}{52}$
12. A king $\frac{1}{13}$
13. A spade $\frac{1}{4}$
14. A black card $\frac{1}{2}$
15. A card other than a 2 $\frac{12}{13}$
16. A face card (a king, queen, or jack) $\frac{3}{13}$

EXAMPLE 2 on p. 699 for Exs. 17–19

LOTTERIES **In Exercises 17 and 18, find the probability of winning the lottery according to the given rules. Assume numbers are selected at random.**

17. You must correctly select 6 out of 48 numbers. The order of the numbers is not important. $\frac{1}{12{,}271{,}512}$
18. You must correctly select 4 numbers, each an integer from 0 to 9. The order of the numbers is important. $\frac{1}{5040}$
19. ★ **MULTIPLE CHOICE** What is the probability (rounded to three decimal places) that 2 randomly selected months both have 31 days? **C**

(A) 0.159 (B) 0.227 (C) 0.318 (D) 0.340

EXAMPLE 3 on p. 700 for Exs. 20–25

ODDS **You randomly choose a marble from a bag. The bag contains 10 black, 8 red, 4 white, and 6 blue marbles. Find the indicated odds.**

20. In favor of choosing white $\frac{1}{6}$
21. In favor of choosing blue $\frac{3}{11}$
22. Against choosing red $\frac{5}{2}$
23. Against choosing black $\frac{9}{5}$

ERROR ANALYSIS ***Describe*** **and correct the error in calculating the odds against getting a 5 or 6 when rolling a six-sided die.**

24. Odds against 5 or 6 $= \frac{4}{6} = \frac{2}{3}$ ✗
25. Odds against 5 or 6 $= \frac{2}{4} = \frac{1}{2}$ ✗

26. ★ **OPEN-ENDED MATH** Flip a coin 10 times. What is the experimental probability of getting heads? **Check students' work.**
27. ★ **SHORT RESPONSE** The probability of event A is 0.3. What are the odds in favor of event A? *Explain.* **See margin.**

EXAMPLE 4 on p. 700 for Exs. 28–32

ROLLING A DIE **The results of rolling a six-sided die 150 times are shown. Use the table to find the experimental probability of the given event.** ***Compare*** **your answer to the theoretical probability of the event.** **28–31. See margin.**

28. Rolling a 5
29. Rolling an even number
30. Rolling a number less than 5
31. Rolling any number but a 3

Roll	⚀	⚁	⚂	⚃	⚄	⚅
Number of occurrences	27	22	18	26	27	30

32. ★ **MULTIPLE CHOICE** You flip a coin 80 times. You get heads 37 times and tails 43 times. What is the experimental probability of getting heads? **A**

(A) 0.4625 (B) 0.5 (C) 0.5375 (D) 0.8605

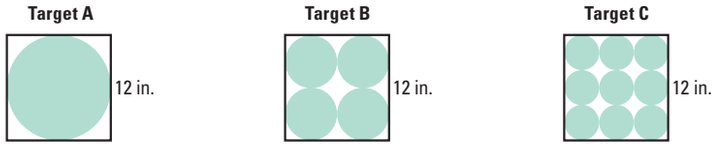
C 33. **REASONING** Find the probability that the vertex of the graph of $y = x^2 - 6x + c$ is above the x-axis if c is a randomly chosen integer from 1 to 20. $\frac{11}{20}$

○ = WORKED-OUT SOLUTIONS on p. WS1 ★ = STANDARDIZED TEST PRACTICE ◆ = MULTIPLE REPRESENTATIONS

27. $\frac{3}{7}$. *Sample answer:* Since the probability is 0.3, there are 3 out of 10 chances of the event occurring. The number of outcomes against event A is $10 - 3 = 7$. So the odds in favor of event A is the ratio of the number of favorable outcomes, 3, to the number of unfavorable outcomes, 7.

28. $\frac{9}{50}$; the experimental probability is slightly greater than the theoretical probability of $\frac{1}{6}$.

34. CHALLENGE Suppose you throw a dart at each square target below. Assume that the dart is equally likely to hit any point inside the target.



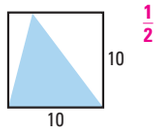
a. Calculate What is the probability that the dart lands inside the circle in target A? inside a circle in target B? inside a circle in target C? $\frac{\pi}{4}, \frac{\pi}{4}, \frac{\pi}{4}$

b. Generalize Consider the general case where a square target with sides 12 inches long contains n^2 identical circles arranged in n rows and n columns. Make a conjecture about the probability that a dart lands inside one of the circles. Then prove your conjecture. **See margin.**

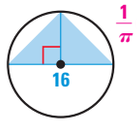
PROBLEM SOLVING

EXAMPLE 5 A on p. 701 for Exs. 35–37

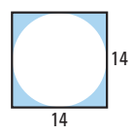
GEOMETRIC PROBABILITY Find the probability that a dart thrown at the given target will hit the shaded region. Assume the dart is equally likely to hit any point inside the target.

35. 

$\frac{1}{2}$

36. 

$\frac{1}{\pi}$ or about 0.318

37. 

$1 - \frac{\pi}{4}$ or about 0.215

@HomeTutor for problem solving help at classzone.com

38. JURY SELECTION A jury of 12 people is selected from a pool of 30 people that includes 12 men and 18 women. What is the probability that the jury will be composed of 12 women? about 0.000215

@HomeTutor for problem solving help at classzone.com

39. ARCHERY The standard archery target used in competition has a diameter of 80 centimeters. Find the probability that an arrow shot at the target will hit the center circle, which has a diameter of 16 centimeters. Assume the arrow is equally likely to hit any point inside the target. $\frac{1}{25}$

40. MULTIPLE REPRESENTATIONS On a typical weekday, there are 1,181,100 one-way trips taken on the public transportation system operated by the Massachusetts Bay Transit Authority. Of these trips, 376,900 are bus rides. Suppose a one-way trip is selected at random.

a. Using Fractions What is the probability, expressed as a fraction, that the trip was taken on a bus? $\frac{3769}{11,811}$

b. Using Decimals What is the probability, expressed as a decimal, that the trip was taken on a bus? about 0.319

c. Using Percents What is the probability, expressed as a percent, that the trip was taken on a bus? about 32%

d. Using Odds What are the odds in favor of the trip having been on a bus? $\frac{3769}{8042}$

Avoiding Common Errors

Exercise 19 Students may use incorrect calculations to arrive at the correct answer. Because $\frac{{}_nC_r}{{}_mC_r} = \frac{{}_nP_r}{{}_mP_r}$, make sure students understand why this exercise involves *combinations* of 2 of 12 months, not *permutations* of 2 of 12 months.

Teaching Strategy

Exercise 33 Students may find it easiest to apply a guess and check strategy using their calculators to solve this problem. Use this exercise as an opportunity to review characteristics of the graphs of parabolas. Specifically, help students see that $y = x^2 - 6x + 9$ has its vertex on the x-axis, so for $c > 9$ the vertex is above the x-axis and for $c \leq 9$ the vertex is on or below the x-axis.

Internet Reference

Exercise 41 Additional information about the Gulf of Mexico can be found at gulfsci.usgs.gov

31. $\frac{22}{25}$; the experimental probability is slightly greater than the theoretical probability of $\frac{5}{6}$.

34b. $\frac{\pi}{4}$; the radius of a circle is $\frac{6}{n}$ inches and since there are n^2 circles, the area of all of the circles is $\pi n^2\left(\frac{6}{n}\right) = 36\pi$ square inches. The area of the square is 144 square inches, so the probability is $\frac{36\pi}{144} = \frac{\pi}{4}$.

29. $\frac{13}{25}$; the experimental probability is slightly greater than the theoretical probability of $\frac{1}{2}$.

30. $\frac{31}{50}$; the experimental probability is slightly less than the theoretical probability of $\frac{2}{3}$.

5 ASSESS AND RETEACH

Daily Homework Quiz

Transparency Available

1. Find the probability of drawing all diamonds when you draw 5 cards from a deck of cards.
$\frac{33}{66{,}640} \approx 0.0005$

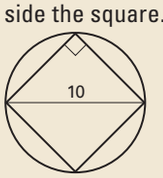
2. Find the odds in favor of drawing a heart when you draw 1 card from a deck of cards. **1:3**

3. The responses to a survey are shown in the table. What is the experimental probability that a randomly chosen subject said "yes"?

Yes	No	Undecided
18	8	2

$\frac{9}{14} \approx 0.623$

5. Find the probability that a dart thrown at the target will hit outside the square. **about 0.363**



Online Quiz

Available at **classzone.com**

Diagnosis/Remediation

- Practice A, B, C in Chapter 10 Resource Book, pp. 28–30
- Study Guide in Chapter 10 Resource Book, pp. 31–32
- Practice Workbook, pp. 153–154
- @HomeTutor

Challenge

Additional challenge is available in the Chapter 10 Resource Book, p. 36.

B

41. GULF COAST The map shows the length of shoreline (in miles) along the Gulf of Mexico for each state that borders the body of water. What is the probability that a ship coming ashore at a random point in the Gulf of Mexico lands in the given state?

a. Texas $\frac{367}{1631}$

b. Florida $\frac{110}{233}$

c. Alabama $\frac{53}{1631}$

42. ★ EXTENDED RESPONSE A magician claims to be able to read minds. To test this claim, five cards numbered 1 through 5 are used. A subject selects two cards from the five cards and concentrates on the numbers.

a. What is the probability that the two numbers chosen are 3 and 4? $\frac{1}{10}$

b. What is the probability that the magician can correctly identify the two numbers by guessing? $\frac{1}{10}$

c. Suppose the magician is able to consistently identify the two numbers about half the time. Does this support the magician's claim to be a mind reader? *Explain.* **No. *Sample answer:* If the magician were really a mind reader, the magician would be able to identify the numbers more than half of the time.**

C

43. CHALLENGE In a guessing game, one player secretly places four different-colored pegs on a board in each of four positions: A, B, C, or D. A second player guesses the configuration of the pegs by placing an identical set of pegs in slots A, B, C, and D on an identical board. The second player is then told how many of the pegs are in the correct slot.

a. What is the probability that the second player has all four pegs correct on the first guess? $\frac{1}{24}$

b. What is the probability that the second player has exactly one peg correct on the first guess? $\frac{1}{3}$

c. The second player is told she has placed two pegs in the correct slot. The player then switches two of the pegs. What is the probability that the player now has all four pegs in the correct slot? $\frac{1}{12}$

MIXED REVIEW

Graph the function. **44–49. See margin.**

44. $y = 4(0.75)^x$ *(p. 486)*

45. $f(x) = 3e^{-2x}$ *(p. 492)*

46. $y = \ln x + 2$ *(p. 499)*

47. $y = \left(\frac{3}{2}\right)^x$ *(p. 478)*

48. $g(x) = \frac{-1}{x+1} - 2$ *(p. 558)*

49. $y = \frac{3x+1}{x^2-4}$ *(p. 565)*

Evaluate the expression without using a calculator. *(p. 499)*

50. $\log_4 64$ **3**

51. $\ln e$ **1**

52. $\log_6 36$ **2**

53. $\log_2 512$ **9**

54. $\ln e^{2.9}$ **2.9**

55. $\log_{1/3} 9$ **−2**

56. $\log_9 27$ $\frac{3}{2}$

57. $\log_4 \frac{1}{32}$ $-\frac{5}{2}$

PREVIEW
Prepare for Lesson 10.4 in Exs. 58–61.

Find the number of combinations. *(p. 690)*

58. ${}_8C_3$ **56**

59. ${}_{10}C_9$ **10**

60. ${}_7C_4$ **35**

61. ${}_{12}C_5$ **792**

EXTRA PRACTICE for Lesson 10.3, p. 1019 **ONLINE QUIZ** at classzone.com

44–49. See Additional Answers beginning on p. AA1.